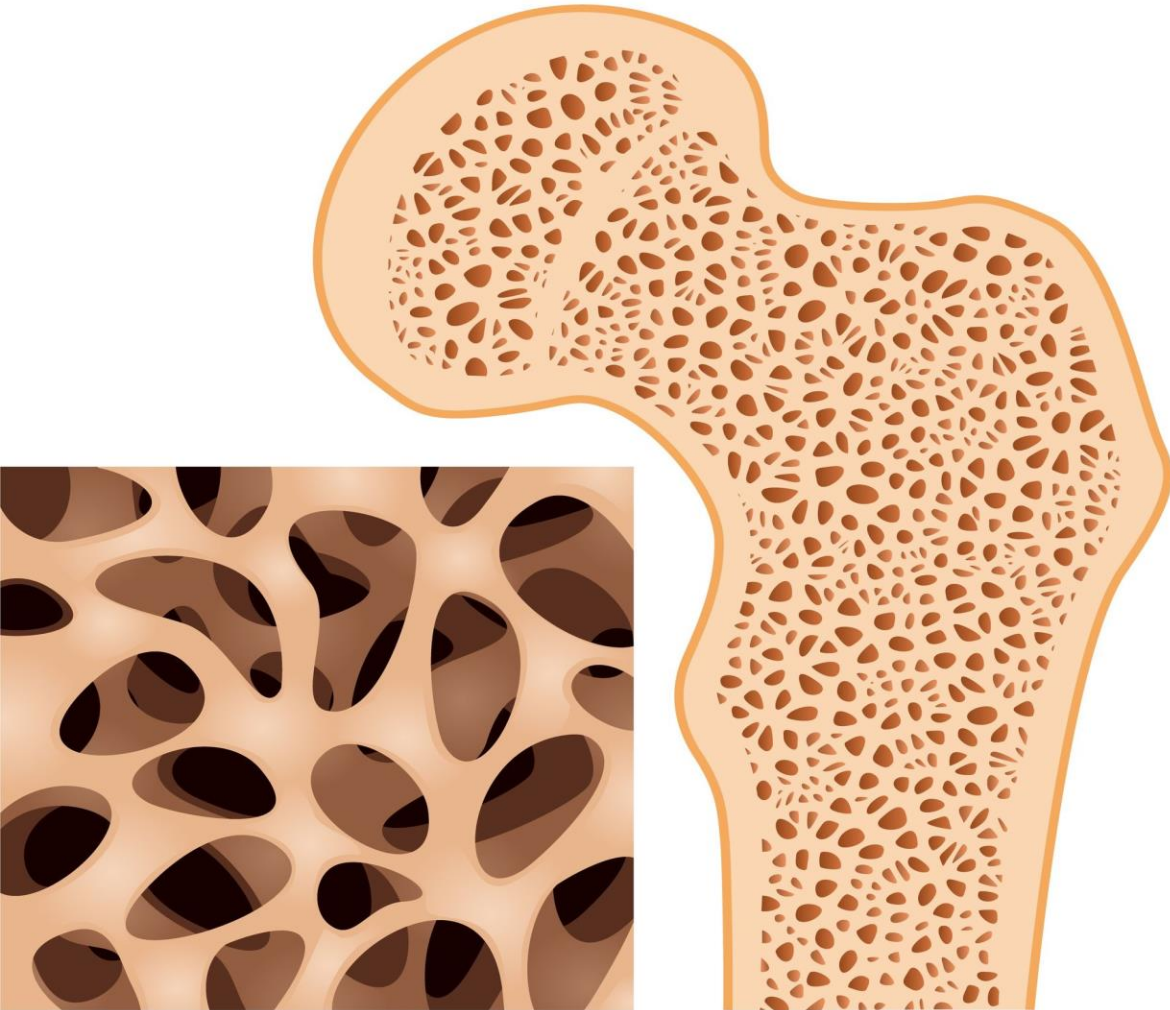
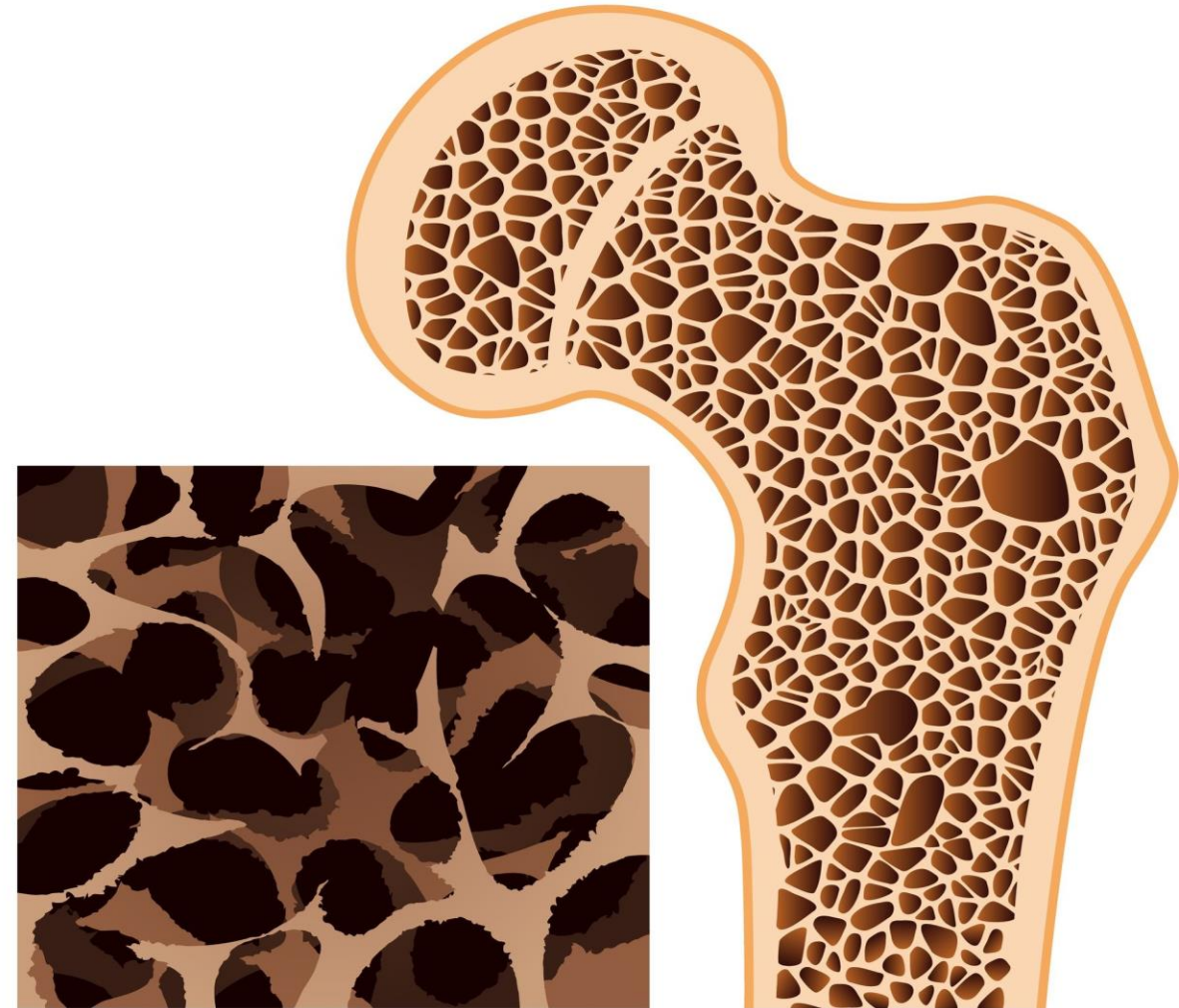



Osteoporosis



Healthy bone




Osteoporosis



Osteoporosis is a progressive disease characterized by **low bone mass** and **micro-architectural deterioration** of bone tissue resulting in increased bone **fragility** and susceptibility to **fracture**. It is an important cause of morbidity in postmenopausal women. The most important complication of osteoporosis is **fracture of the hip**. **Fractures of wrist, vertebrae and humerus** also occur. Increasing age is associated with higher risk of fractures, which occur mostly in those aged over 75 years.

➤ Risk factors for osteoporosis:

- **Female** gender
- **Family history** of osteoporosis (for example, having a mother with an osteoporotic hip fracture doubles your risk of hip fracture)
- **Cigarette** smoking
- Excessive **alcohol** consumption
- **Lack of exercise**
- **Diet low in calcium**
- **Malabsorption** (nutrients are not properly absorbed from the gastrointestinal system)
- **Low estrogen** levels in women (which may occur in menopause or with early surgical removal of both ovaries)
- **Low testosterone** levels in men (hypogonadism)
- **Chemotherapy** that can cause early menopause due to its toxic effects on the ovaries

- 
- Chronic inflammation, due to chronic inflammatory **arthritis** or diseases, such as **rheumatoid arthritis**, **gout** or **liver** diseases
 - **Hyperthyroidism**, a condition wherein too much **thyroid hormone** is produced by the thyroid gland
 - **Hyperparathyroidism** is a disease wherein there is excessive parathyroid hormone production by the parathyroid gland. Normally, parathyroid hormone maintains blood calcium levels by, in part, removing calcium from the bone.
 - When **vitamin D** is lacking, the body cannot absorb adequate amounts of calcium from the **diet** to prevent osteoporosis. **Vitamin D deficiency** can result from dietary deficiency, lack of sunlight, or lack of intestinal absorption of the vitamin.
 - Certain medications can cause osteoporosis. These medicines include long-term use of **heparin** (a blood thinner), antiseizure medicine such as **phenytoin** and phenobarbital, and long-term use of oral **corticosteroids** (such as **prednisone**).



Prevention

As complications of osteoporosis have enormous economic implications, preventive measures are extremely important. **Regular exercise** has been shown to **halve the risk of hip fractures**. **Stopping smoking** before the menopause reduces the risk of **hip fractures by 25%**.

Treatment

1) Vitamin D and calcium:

Vitamin D deficiency is common in elderly people. Treatment for **12–18 months** with **800 IU** of vitamin D plus **1.2 g** of calcium given daily has been shown to **reduce hip and non-vertebral fractures in elderly women** (mean age 84 years) living in sheltered accommodation. It is not known whether vitamin D supplementation alone reduces hip fractures. Calcium supplementation on its own **does not reduce** fracture incidence and is no longer recommended for treatment of osteoporosis.




2) Calcitriol and alfacalcidol:

Calcitriol (1,25-dihydroxyvitamin D), the **active metabolite of vitamin D**, and **alfacalcidol**, a **synthetic analogue of calcitriol**, **reduce bone loss** and have been shown to **reduce vertebral fractures**. **Serum calcium should be monitored regularly** in patients receiving these drugs.

3) Bisphosphonates:

Bisphosphonates, **synthetic analogues of pyrophosphate**, bind strongly to the bone surface and **inhibit bone resorption**. Currently, three **oral** bisphosphonates are available for the treatment of osteoporosis: **alendronate, etidronate and risedronate**.


Alendronate can be given either **daily** (10 mg) or **weekly** (70 mg) with equal efficacy. It is effective in **reducing vertebral, wrist and hip fractures by about 50%**.



Etidronate is given cyclically with calcium supplements to **reduce the risk of bone mineralization defects**. It **reduces the risk of vertebral fractures by 50%** in postmenopausal women. There is no evidence to support its effectiveness in preventing hip fractures.

Risedronate **reduces vertebral fractures by 41% and non-vertebral fractures by 39%**. It has been shown to significantly reduce the risk of **hip fractures** in postmenopausal women.

Alendronate and risedronate are currently used as **first-line drugs** in older women with osteoporosis.

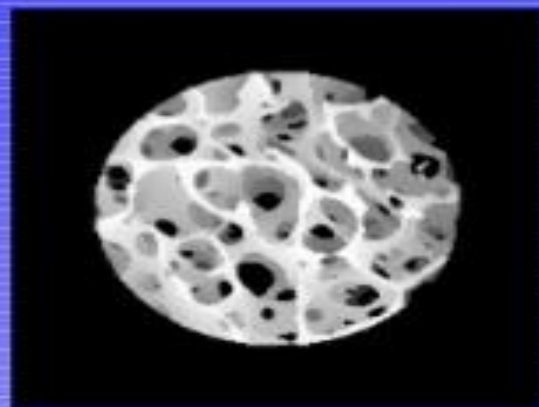


Intravenous ibandronate, given at a dose of **3 mg once every 3 months**, can be used for treatment of postmenopausal osteoporosis. It can also be given **orally** at a dose of **150 mg once monthly**.

All bisphosphonates cause gastro-intestinal side effects.

Alendronate and risedronate are associated with **severe oesophageal reactions including oesophageal stricture**. Patients should not take these tablets at **bed-time** and should be advised to **stay upright for at least 30 min** after taking them. They should **avoid food for at least 2 h before and after taking etidronate**. Alendronate and risedronate should be taken **30 min before the first food or drink of the day**. Bisphosphonates should be avoided in patients with renal impairment.

Thank You



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